

Historic, archived document

Do not assume content reflects current
scientific knowledge, policies, or practices.

me
17
378
. 12 No. 7

FEBRUARY 16, 1962

U. S. DEPT. OF AGRICULTURE
LIBRARY
FEB 27 1962
CURRENT SERIAL RECORDS

Cooperative
**ECONOMIC INSECT
REPORT**

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG populations continue noneconomic in Texas and Oklahoma; however, close observations recommended in both states if favorable weather conditions occur. Other GRAIN PESTS continue noneconomic in Southwest. Light but increasing populations of PEA APHID on alfalfa in central and southwest Arizona. (p. 81). COMMON CATTLE GRUB infesting cattle in areas of Georgia and Arkansas, and continues active over Oklahoma. (p. 83). LADY BEETLES light in small grains and winter peas in scattered fields in southwest and south central Oklahoma, and active in alfalfa fields in New Mexico lightly infested with pea aphid and spotted alfalfa aphid. Adults of a Cuban May beetle (Phyllophaga bruneri) taken in Miami, Dade County, Florida, on 2 dates in January are first records for that month, and indicate adults are probably present during entire year. (p. 85).

Forecasts of Insect Conditions

GRASSHOPPER surveys indicate that more than 1,000,000 acres of Forest Service land in 11 states and over 1,000,000 acres of U. S. Department of Interior land are economically infested. The outlook for 1962 appears somewhat more serious than that for 1961, especially in Montana. (p. 93).

Insect Detection

A scarab (Ceratophyus sp.) collected in Santa Barbara County, California, is probably first record of this genus in the Western Hemisphere. (p. 85). Very heavy infestation of northern fowl mite on 4,000 chickens in Sharp County, Arkansas, is first record for that county. (p. 84).

Special Reports

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1961

Introduction - (p. 87).

Weather of the Year 1961 - (p. 89).

Summary of Insect Conditions - 1961 - (p. 93).

Grasshoppers - (p. 93).

The Scientific Name of the Cowpea Aphid. (p. 86).

NOTE

Volume 11 of "Insects Not Known to Occur in the United States" is now available on request. This is a compilation of the separates, numbers 129-141, appearing in the Cooperative Economic Insect Report, Volume 11, 1961. PPC Division personnel will receive copies through their Regional Offices. Also available, in limited numbers, are Volumes 7, 8, 9 and 10 for the years 1957 through 1960.

Another publication, "Survey Methods" - 1958, is also available.

Reports in this issue are for week ending February 9 unless otherwise indicated.

WEATHER OF THE WEEK ENDING FEBRUARY 12

Temperatures for the week averaged above normal west of a line joining Bismarck, North Dakota, and New Orleans, Louisiana, and below normal east of this line. Significant precipitation fell in many areas west of the Continental Divide, but was mostly limited to Florida and the Ohio Valley and adjacent areas in the East.

In the Far West, where temperatures were rising most of the period, the week was 3° to 6° warmer than normal in the Great Basin and as much as 12° in the central Rockies. The abnormally mild weather in the Great Basin followed 3 weeks of unusually low temperatures there. Near-record-high temperatures for the date in Colorado reached the 70's and 80's in the eastern plains and the 50's and 60's in the mountains and western portions. The warm weather rapidly melted ice and snow in Wyoming and eastern Idaho where some locally severe flooding was reported.

Heavy rains and snow in the Far West further brightened the water outlook there for the warm season of 1962, even though damaging floods and landslides occurred along the south coast of California where rainfall for the week totaled 2 to 9 inches. In the remainder of the State, total moisture generally ranged from 1.50 to 3.50 inches, except 2.00 to 9.00 inches in the mountains and only 0.10 to 0.35 inch in the northeastern and southeastern interior sections. In the northern mountains of California above 4,500 feet, the snow depth increased 54 inches at Soda Springs and 69 inches at Badger Pass. Heavy precipitation extended into Arizona and Utah, and considerable flooding was reported in the latter State.

Wide temperature fluctuations occurred in the eastern half of the Nation. The coldest weather in the midcontinent region occurred during a cold air intrusion early in the week when some extreme lows reported included -42° at Crane Lake, Minnesota; -37° at Gordon, Wisconsin; -18° at Waukon, Iowa; and -32° at Pellston, Michigan. In Michigan, the temperature remained below freezing in the entire State after Monday and daily minima were zero or below until the last night of the period. Rising temperatures in the midcontinent area during the latter part of the period rose into the 70's as far north as South Dakota and set new records for February at Scottsbluff, North Platte and Grand Island, Nebraska. The weather was mild east of the Appalachians at the beginning of the period, with high temperatures in the 50's and 60's recorded northward into New England. Cold weather prevailed after the first or second day of the period, however, with lowest temperatures occurring during the weekend when the minima at many points in northern New York State ranged from -10° to -40° and a low of -21° was recorded at St. Johnsbury, Vermont. Earlier in the week, Greenville, Maine, reported -26°.

Little or no precipitation fell in the Great Plains. Most of the precipitation in the Ohio Valley and Southeast fell on Thursday and Friday. In Florida, the week's moisture, which totaled 0.75 to 1.00 inch in the north-central Peninsula, 0.50 inch in the north and west, and 0.25 to 0.50 inch in the southern third of the State, was very beneficial in the north but furnished only temporary relief in the south which is plagued by dry soil and a high fire hazard.

The snow cover in the East was extended southward from the extreme Northeast to southern West Virginia and south-central Virginia by snowfall on Thursday and Friday. Northern portions of Ohio and Indiana also were covered by 1 to 4 inches of snow during this storm. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - TEXAS - Populations continue at noneconomic levels in all areas following severe freeze. Warm, open weather may contribute to spring buildups, and surveys will be conducted accordingly. (Newton). OKLAHOMA - Noneconomic populations continue throughout State; counts ranged 0-6 per linear foot in west central and southwest and 0-2 per linear foot in southeast and east central areas. Close observation recommended to prevent buildup if favorable weather occurs. (Okla. Coop. Sur.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Light populations, 0-7 per linear foot, noted on wheat in Kiowa and Washita Counties. None noted in fields checked in Tillman-Cotton County area. Up to 8 per linear foot noted in Jefferson County. (Okla. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Light populations, 3 per linear foot, noted on wheat in Jefferson County. (Okla. Coop. Sur.). OREGON - Aphids reported heavily infesting fall planted wheat week ending November 11, 1961, identified as this species and Rhopalosiphum sp. Determination by Dr. C. F. Smith, North Carolina State College. Cf. CEIR 11(46):1043.(Capizzi).

ENGLISH GRAIN APHID (Macrosiphum granarium) - OKLAHOMA - Light populations on wheat in Kiowa and Washita Counties; fields checked in Tillman and Cotton Counties negative. (Okla. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - TEXAS - Populations continue at noneconomic levels in all areas following severe freeze. Warm, open weather may contribute to spring buildups; surveys will be conducted accordingly. (Newton). OKLAHOMA - Light, up to 15 per linear foot, on small grains throughout southwest and central areas. (Okla. Coop. Sur.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Light to medium populations, 1-6 per linear foot, on small grains throughout southwestern area; larvae of various sizes with little feeding damage noted. (Okla. Coop. Sur.).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - OKLAHOMA - Check in Harmon County revealed 10 larvae per 25 stalks; 80 percent of larvae were dead. (Okla. Coop. Sur.).

A CRANE FLY (Tipula sp., not simplex) - CALIFORNIA - Heavy larval infestation in soil around alfalfa roots at Witter Springs, Lake County. (Cal. Coop. Rpt.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Infestations very low on alfalfa statewide. (Ariz. Coop. Sur.). OKLAHOMA - Checks in alfalfa in southwestern area negative, but light populations on alfalfa in southeastern area, with 0.25 to 0.5 per square foot noted. (Okla. Coop. Sur.). NEW MEXICO - Infestations very light in alfalfa fields in Dona Ana, Sierra and Otero Counties; no infestations found on alfalfa in Luna County. (N. M. Coop. Rpt.).

PEA APHID (Macrosiphum pisae) - ARIZONA - Light but increasing populations continue on alfalfa in central and southwest areas. (Ariz. Coop. Sur.). OKLAHOMA - Checks of alfalfa in southwest negative, but light populations on alfalfa in southeast area, with 2 per square foot noted. (Okla. Coop. Sur.). NEW MEXICO - Infestations very light in alfalfa fields in Dona Ana, Sierra and Otero Counties; no infestations found in alfalfa in Luna County. (N. M. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Light infestations of 4 to 5 aphids per plant present on young safflower in central area. (Ariz. Coop. Rpt.).

FRUIT INSECTS

EASTERN TENT CATERPILLAR (Malacosoma americanum) - TEXAS - Egg masses abundant on fruit trees, principally peach and plum, in Austin area, Travis County. (Cook).

CITRICOLA SCALE (Coccus pseudomagnoliarum) - ARIZONA - Light infestations in a few grapefruit groves in Peoria area, Maricopa County; counts of 20-30 scales per leaf common in heaviest infested areas. (Ariz. Coop. Sur.).

CHAFF SCALE (Parlatoria pergandii) - FLORIDA - Light infestation on 7,650 plants of Citrus sinensis at Umatilla, Marion County, and moderate infestations at Glenwood, Volusia County. (Graham, Roberts, Feb. 1).

CARPENTERWORM (Prionoxystus robiniae) - ALABAMA - Moderately infested 20 acres of young pecans in Houston County. (Buttram).

TRUCK CROP INSECTS

TOMATO PINWORM (Keiferia lycopersicella) - TEXAS - Caused light damage to leaves and fruit of greenhouse tomatoes in Cherokee County. (Young).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light infestations on tobacco in the plant bed in Colquitt, Cook and Berrien Counties. (Johnson, Jan. 31). Light infestations on tobacco in the plant bed in Irwin, Tift, Berrien, Cook and Worth Counties. (Johnson).

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella) - FLORIDA - Total of 66 larvae collected from 29 blooms and 1,091 bolls of wild cotton on 2 locations near northern Key Largo, Monroe County. (Creamer, Jan. 27). Two larval specimens collected from 85 hibiscus blooms at Islamorada, Upper Matecumbe Key, Monroe County. (Fla. Coop. Sur.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SILVER-SPOTTED TIGER MOTH (Halisidota argentata) - WASHINGTON - Larvae feeding on fir (Abies spp.) and Douglas-fir (Pseudotsuga spp.) in Mount Vernon area, Skagit County. (Brannon).

A PINE TIP MOTH - TEXAS - Live pupae of an unidentified species very abundant in 2-year-old pine trees in Denton County. Attempts to rear moths from infested terminals being made. (Newton).

A WHITEFLY (Aleuroplatus coronatus) - CALIFORNIA - Light on European chestnut in Santa Paula, Ventura County. (Cal. Coop. Rpt.).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - FLORIDA - Collected on native plum (Prunus sp.) at Gainesville, Alachua County. Det. by L. A. Hetrick. Eggs hatched on February 4 at Gainesville. (Fla. Coop. Sur.).

SOUTHERN ARMYWORM (Prodenia eridania) - FLORIDA - Few, scattered infestations on chrysanthemums at Punta Gorda, Charlotte County. (Walsh, Jan. 29).

A PHYCITID MOTH (Acrobasis grossbecki) - FLORIDA - Infested Pyracantha sp. at Allandale, Volusia County. (E. B. Smith, Jan. 25).

A WEEVIL (Artipus floridanus) - FLORIDA - Generally moderate on Podocarpus sp. in nursery at Cocoa, Brevard County, on January 26. (Fla. Coop. Sur.).

AN APHID (Cinara tujafilina) - FLORIDA - Severe on arborvitae at Hawthorn, Alachua County; lighter at Monticello, Jefferson County. (Dekle, McCowan, Miller, Feb. 1).

Coccids in Florida - FLORIDA WAX SCALE (Ceroplastes floridensis) light on schefflera at Fort Lauderdale, Broward County, and staghornfern at Largo, Pinellas County (Jan. 25). FLORIDA RED SCALE (Chrysomphalus aonidum) moderate to severe on Paurotis wrighti at Largo, Pinellas County, and on Zamia sp. at Cocoa, Brevard County (Jan. 26). COCONUT MEALYBUG (Pseudococcus nipae) infested 30 percent of 80 plants of Phoenix roebeleni at Samsula, Volusia County (Jan. 26). Phenacaspis cockerelli moderate on 200 Magnolia sp. plants at Eustis, Lake County (Jan. 31). Asterolecanium pustulans moderate on oleander at Nocatee, De Soto County, and on Africanviolet at Fort Pierce, St. Lucie County (Jan. 31). (Fla. Coop. Sur.).

Coccids in Virginia - WHITE PEACH SCALE (Pseudaulacaspis pentagona) heavy on privet at a location in Kenbridge, Lunenburg County (Amos, Powers, Jan. 6) and on cherry trees at a location in Gate City, Scott County (Amos, Rich, Jan. 22). JUNIPER SCALE (Diaspis carueli) infesting juniper shrubs at a location in Newbern, Pulaski County. (Amos, Allison, Jan. 23). Probably BROWN SOFT SCALE (Coccus hesperidum) heavy on begonia at a Lynchburg location, Campbell County. (Amos, Feb. 2). EUONYMUS SCALE (Unaspis euonymi) heavy at a location in West Point, King William County. (Rowell, Jan. 14).

BULB MITE (Rhizoglyphus echinopus) - CALIFORNIA - Heavy infestation of adults on roots of iris at Arlington, Riverside County. (Cal. Coop. Rpt.). FLORIDA - Infested amaryllis bulbs at a commercial establishment in Miami, Dade County. (McMillan, McFarlin, Jan. 30).

INSECTS AFFECTING MAN AND ANIMALS

COMMON CATTLE GRUB (Hypoderma lineatum) - GEORGIA - Survey in 5 counties showed infestations on cattle in 3 counties. Ranged 0.5-4 per animal on 53 infested head, of 143 cattle inspected in Putnam, Sumter and Thomas Counties. Inspection negative on 65 cattle in Glynn and Toombs Counties, February 2. Larval emergence 10-20 percent completed February 6 in Putnam County on cattle with average of 2.4 larvae per animal on January 23. Two herds of 31 cattle each inspected in Burke County; 23 head infested in one herd with average of 5.94 per animal and high of 40 on one bull; infestation in second herd averaged 9.6 per head on 24 animals. (Roberts). ARKANSAS - Check of 2 untreated herds in Carroll County showed one herd with average infestation of 5.1 per animal and second herd with average of 4.1 per animal. One treated herd was negative. All counts made January 23. (Ark. Ins. Sur.). OKLAHOMA - Populations somewhat lower than in past weeks. Ranged 0-33 per head (averaged 12) on yearling steers and heifers and ranged 0-2 per head on mature cows in Payne County. Activity continues over State. (Okla. Coop. Sur.).

CATTLE GRUBS (Hypoderma spp.) - UTAH - Appeared on backs of cattle in Cache County. In Uintah County, 250 cattle treated by new systemics for grub control. (Knowlton, Lindsay).

CATTLE LICE - GEORGIA - Inspection of 173 cattle in Putnam, Sumter, Thomas and Toombs Counties negative. Inspection in Glynn County indicated 15 cattle with heavy infestations and 20 cattle negative on February 2. Infestations moderate to heavy on 25 herd bulls. (Johnson, Roberts). OKLAHOMA - Activity continues throughout State. (Okla. Coop. Sur.). UTAH - Numerous cattle annoyed in Uintah County; 500 cattle dipped and 700 sprayed for control; 250 cattle treated by new systemics for lice control. (Knowlton, Lindsay).

HOG LOUSE (Haematopinus suis) - OKLAHOMA - Continues to be reported in Beaver, Woodward and Sequoyah Counties. (Okla. Coop. Sur.). NEW MEXICO - Problem on swine in Bernalillo County; fair control obtained. (N. M. Coop. Rpt.).

HORSE SUCKING LOUSE (Haematopinus asini) - WASHINGTON - Heavy infestation on a horse at Stevenson, Skamania County. (Brannon).

CHICKEN BODY LOUSE (Menacanthus stramineus) - NEW MEXICO - Serious problem in flocks in Albuquerque area, Bernalillo County, possibly due to this pest. Good chemical control obtained. (N. M. Coop. Rpt.).

NORTHERN FOWL MITE (Ornithonyssus sylviarum) - ARKANSAS - Very heavy on 4,000 chickens in Sharp County. This is a new county record. Mites were numerous and caused blackened feathers. (Ark. Ins. Sur.). VIRGINIA - Heavy on chickens at a location in Westmoreland County. Det. by L. Cagle. (Tarpley, Dawson, Dec. 22, 1961).

A BEAVER ECTOPARASITE (Alphalaelaps aplodontiae) - CALIFORNIA - Medium infestation discovered on adult beaver at Smith River, Del Norte County. (Cal. Coop. Rpt.).

MOSQUITOES - TEXAS - No control activities conducted in Jefferson County during January. (Jan. Rpt. Jefferson Co. Mosq. Cont. Comm.).

HOUSEHOLD AND STRUCTURAL INSECTS

BROWN-BANDED COCKROACH (Supella supellectilium) - MARYLAND - Infested home at Baltimore. (U. Md., Ent. Dept.). WASHINGTON - Heavy infestation in home in Pullman area, Whitman County. (Johansen).

LARGER YELLOW ANT (Acanthomyops interjectus) - MARYLAND - Winged forms appeared in homes locally in Montgomery and Talbot Counties. (U. Md., Ent. Dept.).

CARPENTER ANTS (Camponotus spp.) - TEXAS - Becoming a nuisance and causing concern to residents locally in Houston area, Harris County, and Marble Falls area, Burnet County. (Tex. Coop. Rpt.).

BOXELDER BUG (Leptocoris trivittatus) - MARYLAND - Adults and nymphs entered home at Pikesville, Baltimore County. (U. Md., Ent. Dept.). VIRGINIA - Very abundant around and entering a home in Blacksburg, Montgomery County. (Tarpley, Fuller, Jan. 20).

AN EARWIG - ALABAMA - Many severe infestations in homes in Russell and Lee Counties due to increased activity caused by warm weather. (Buttram).

A SILVERFISH (Lepisma sp.) - NEW MEXICO - Very abundant in several homes in Dona Ana and Bernalillo Counties. (N. M. Coop. Rpt.).

CASEMAKING CLOTHES MOTH (Tinea pellionella) - TEXAS - Heavy on wool carpeting in home in Eastland County. (Cooper).

OLD-HOUSE BORER (Hylotrupes bajulus) - VIRGINIA - Larva collected in floor joist of 2-year-old home in Pearisburg, Giles County. (Rowell, Holpp, Jan. 4). Several larvae collected at Chester, Chesterfield County; had caused considerable damage to pine sills and framework of a house. (Amos, Jones, Feb. 6).

ROUNDHEADED WOOD BORERS - UTAH - Emerged from Siberian elm and American elm fire-place logs in 2 homes at Logan, Cache County. (Knowlton, Call).

STORED-PRODUCT INSECTS

INDIAN-MEAL MOTH (Plodia interpunctella) - VIRGINIA - Heavy infestation in a home in Luray, Page County. (Tarpley, Scott, Feb. 2).

DRIED-FRUIT BEETLE (Carpophilus hemipterus) - CALIFORNIA - Medium infestation on rotten sweetpotatoes at Livingston, Merced County. (Cal. Coop. Rpt.).

BENEFICIAL INSECTS

LADY BEETLES - OKLAHOMA - Light populations in small grains and winter peas in scattered fields in southwest and south central areas. (Okla. Coop. Sur.). NEW MEXICO - Active in alfalfa fields having light infestations of Macrosiphum pisi and Therioaphis maculata. (N. M. Coop. Rpt.).

MISCELLANEOUS INSECTS

A CUBAN MAY BEETLE (Phyllophaga bruneri) - FLORIDA - Adults taken in light traps at 2 localities in Miami, Dade County, on January 11 and 25. These are first records for January and indicate that adults are probably present during entire year. (Fla. Coop. Sur.).

A SCARAB (Ceratophyus sp.) - CALIFORNIA - This scarab of the subfamily Geotrupinae not yet placed to species was collected 6 miles north of Lompoc and at Vandenberg Air Force Base, Santa Barbara County. So far as known, this is the first record of this genus in the Western Hemisphere. Early investigation shows this beetle to have burrows from 6 inches to 3 feet with mounds from 2 to 4 inches at the surface, causing unsightly conditions on lawns and golf courses. This beetle is a member of a group which normally feeds on dung and decaying organic matter. Investigation of this species is being pursued. (Cal. Coop. Rpt.).

COCKROACHES - FLORIDA - Following species intercepted on shipment of bananas at Tampa, Hillsborough County, on October 25, 1961. Neoblattella fratercula, Neoblattella n. sp. and Nyctibora sp. Det. by A. B. Gurney; collected by J. W. Patton. (Fla. Coop. Sur.).

A MIRID BUG (Bothynotus modestus) - FLORIDA - Collected at Daytona Beach, Volusia County, on January 4, in Steiner trap. Det. by R. F. Hussey. A seldom collected species. (Desin).

AN EARWIG (Labia curvicauda) - FLORIDA - Rarely collected species found on Islamorada, Monroe County, on December 28, 1961. (Fla. Coop. Sur.).

SLUGS - CALIFORNIA - GRAY GARDEN SLUG (Deroceras reticulatum) and two introduced slugs, D. caruanae and Arion echinopus found under boards and stones in Golden Gate Park, San Francisco, San Francisco County; infestation light. (Cal. Coop. Rpt.).

LIGHT TRAP COLLECTIONS

	Estig. acrea	Spodop. exigua	Feltia subterr.	Prod. ornith.	Helio. zea	Pseud. unip.	Agrot. ips.
ARIZONA							
Mesa 2/1-7	1	21	46	1			
FLORIDA							
Quincy 2/5			3		1		
SOUTH CAROLINA							
Charleston 2/5-11			17	5		4	6

THE SCIENTIFIC NAME FOR THE COWPEA APHID

The aphid, on various crops in the United States, that until recently has been determined as Aphis medicaginis Koch, probably has been misidentified and is now thought to be Aphis craccivora Koch. There is some doubt at present that A. medicaginis even occurs in North America. European workers have stated that A. medicaginis is found only on legumes, while A. craccivora has many other hosts as well as legumes. The Federal specialist in the group, Miss Louise M. Russell, would welcome specimens thought to be A. medicaginis. Collections should be sent to Dr. W. H. Anderson, Insect Identification and Parasite Introduction Research Branch, Entomology Research Division, Agricultural Research Service, Beltsville, Maryland.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1961

INTRODUCTION

The summary of insect conditions beginning in this issue and continuing in several succeeding issues of the Cooperative Economic Insect Report was compiled in Survey and Detection Operations from annual summaries that were submitted by various State and Federal cooperators. This is the third year that a compiled summary has been published. The summary will follow the same format which is used in the weekly issues of the CEIR, with some minor exceptions.

Survey and Detection Operations is especially grateful to each individual who assisted with the preparation of the 1961 summary. Listed below are the names of individuals who helped assemble the data for the summary.

ALABAMA

J. R. Buttram

ALASKA

R. H. Washburn

ARIZONA

Leon Moore et al.

ARKANSAS

W. P. Boyer

CALIFORNIA

R. M. Hawthorne et al.

COLORADO

L. E. Jenkins et al.

CONNECTICUT

J. P. Johnson, A. Hawkins,
E. C. Minnum, R. J. Quinton,
M. Savos, J. C. Schread

DELAWARE

P. B. Burbutis

FLORIDA

R. E. Woodruff, W. A. Simanton

GEORGIA

W. C. Johnson et al.

IDAHO

A. R. Gittins et al.

ILLINOIS

C. E. White, R. Meyer

INDIANA

J. V. Osmun, W. L. Butts, H. O. Deay,
R. C. Dobson, R. T. Everly, R. L.
Giese, G. E. Gould, D. L. Hamilton,
G. E. Marshall, D. L. Matthew, J. D.
Paschke, D. L. Schuder, M. C. Wilson

KANSAS

L. L. Peters, C. C. Burkhardt,
L. J. DePew, E. L. Eshbaugh,
T. L. Harvey, F. W. Knapp,
H. C. Knutson, R. H. Painter,
R. L. Parker, C. W. Pitts,
E. L. Soderstrom, H. E. Thompson,
D. A. Wilbur, D. E. Gates, J. H. L.
Bell, D. J. Fitchett, H. Hohnholt,
E. T. Jones, W. H. Somsen,
G. D. White, L. A. Calkins,
R. D. Charlton, C. Guldner

MAINE

L. W. Boulanger, R. W. Nash et al.

MARYLAND

W. C. Harding, Jr.

MICHIGAN

Ray Hutson

MINNESOTA

R. G. Flaskerd

MISSOURI

R. E. Munson et al.

MONTANA

G. R. Roemhild, E. H. Juntunen

NEBRASKA

P. W. Bergman, J. Bell, C. Calkins,
D. Fitchett, A. Hagen, J. Herhahn,
R. Hill, C. Jones, D. Kindler,
A. Kishaba, G. Manglitz, K. Pruess,
W. Rapp, R. Roselle, R. Staples,
H. Stevens, G. Stokes, C. Walstrom,
M. Webb

NEVADA

R. C. Bechtel et al.

NEW HAMPSHIRE

J. G. Conklin

NEW JERSEY

Department of Entomology, Rutgers University; and Department of Agriculture, Division of Plant Industry, State of New Jersey

NEW MEXICO

New Mexico Cooperative Survey

NEW YORK

A. A. Muka et al.

NORTH DAKOTA

V. V. Goodfellow

OHIO

Ohio Agricultural Experiment Station staff, James Walker et al.

OKLAHOMA

S. E. Kunz et al.

OREGON

Joe Capizzi et al.

PENNSYLVANIA

E. J. Udine

RHODE ISLAND

H. L. Hansen, J. A. Mathewson, T. W. Kerr, Jr.

SOUTH DAKOTA

R. L. Hanten

TEXAS

W. H. Newton et al.

UTAH

G. F. Knowlton, D. W. Davis, H. F. Thornley, H. E. Dorst, B. A. Haws, J. L. Frykman et al.

VERMONT

G. B. MacCollom

VIRGINIA

M. A. Tarpley, W. S. Hough, M. L. Bobb, R. N. Hofmaster, C. B. Dominick, C. R. Willey, F. R. Freund

WASHINGTON

C. A. Johansen et al.

WISCONSIN

M. S. Conrad, D. A. Mount

WYOMING

D. G. Fullerton

Also included in the 1961 summary are notes from the following special reports.

"Forest Insect Conditions in the United States - 1961". Compiled by J. W. Bongberg, D. Crosby, W. J. Buckhorn, P. W. Orr, R. C. Hall, T. T. Terrell, R. I. Washburn, F. M. Yasinski, D. A. Pierce, P. Flink, D. Renlund, J. F. Wootten, W. D. Buchanan, D. VanDenburg, D. Ketcham, W. L. Freeman, Jr.; and the Division of Timber Management at Denver, Colorado, and Division of State and Private Forestry, Milwaukee, Wisconsin. The above-named summary is issued by the U. S. Forest Service and will be available upon request later in 1962.

"Summary of Fruit and Insect Conditions, 1961 New York-New England Fruit Spray Specialist Conference", compiled by L. W. Boulanger, Maine Agricultural Experiment Station, from the conference held at Burlington, Vermont, October 25, 1961.

"Summary of Cotton Insect Conditions in South Carolina and Mississippi - 1961", compiled by H. M. Taft and M. E. Merkl.

WEATHER OF THE YEAR 1961

Conditions in Brief

Mild, dry weather prevailed in the northern Great Plains and Far West during the first 2 months of 1961. In the lower Great Plains and East, the weather was cold and stormy in January, but unseasonably mild in February. Extremely cold weather persisted in the Northeast from January 18 to February 4. A blizzard occurred in southern New England on January 19 and 20, and an 18-inch snowstorm in New York City on February 3 to 5. Spring was cold, wet, and stormy in the eastern half of the Nation, and about normal in the western half. Snowfall during winter and spring in the Far West was much below normal except in extreme northern areas. Damaging floods occurred in Iowa and Wisconsin in March, in Indiana in April, and in Kansas and the Ohio Valley in May. Summer was unusually hot and dry in the northern Great Plains and Far West. Crop acreages were reduced in many areas of the Far West owing to a short supply of irrigation water, and a high fire hazard existed for prolonged periods. In California, high temperatures on June 13 to 17 damaged fruit and vegetables to the extent of millions of dollars. Spring and summer drought reduced small grain yields in the northern Great Plains. Summer was about normal in the rest of the country, except less hot than usual in south-central areas. Autumn was cooler than normal from the Great Plains to the Pacific Coast, and abnormally mild east of the Mississippi River. This temperature pattern held true for each of the three fall months. Autumn precipitation was abnormally heavy in most of the midcontinent area and Rocky Mountain region, but was extremely deficient in the South Atlantic States.

Month by Month Summary

JANUARY - This was one of the driest and sunniest Januarys on record. In most interior sections of the country precipitation was less than 25 percent of normal and sunshine ranged from 140 to 200 percent of normal. Temperatures during the month were unusually mild in the northern Great Plains and Far West. San Diego and Los Angeles, California, had their warmest January on record. Temperatures for the month averaged well below normal in the lower Great Plains and east of the Mississippi River, owing to extremely cold weather which began on January 20 and persisted through the remainder of the month. During this period, subzero minima ranged from -40° or lower in North Dakota and Minnesota, to -1° or lower in Texas, Arkansas, and northern Georgia. The first general freeze of the winter occurred in the Florida Everglades, with lowest temperatures there on the morning of the 22d. In much of the South this was the coldest January since 1940, and December 1960 and January 1961 combined was the coldest such period in the middle and lower Atlantic Coastal States since 1917-18. Snowfall, while generally less than 50 percent of normal, was heavier than usual in north Texas and the Northeast. Two major snowstorms occurred in the latter area. The first, on the 15th and 16th, deposited several inches of snow in western Maryland, southeastern portions of Pennsylvania and New York, western Massachusetts, and as much as 10 to 15 inches in south-central Massachusetts and northwestern Connecticut. The second major snowstorm occurred on the 19th and 20th, when falls in Maryland totaled about 2 inches in southern portions of the State, and from 5 to 16 inches in north-central and western portions, and nearly 8 inches in Washington, D. C. In New Jersey, 10- to 12-inch falls were measured over most of the State, with 24 to 30 inches in the extreme northwestern portion. Most of Pennsylvania received 4 to 12 inches, with as much as 19 inches in the Susquehanna Valley, southeastern New York 6 to 12 inches, and southern New England 10 to 20 inches. This second heavy snowstorm was a blizzard in southern New England where 10- to 15-foot drifts virtually paralyzed normal activities. This was the second blizzard of the winter in New England where true blizzards are rather rare.

FEBRUARY - In general the weather was mild and dry in the western half of the Nation, and mild and wet in the East. However, the first week was unusually cold in the East, and in parts of the Northeast one of the most prolonged, severe cold periods on record ended February 4 when temperatures rose above freezing for the first time since January 18. Frost penetration was unusually deep in many northern areas, and frozen water pipes were reported in sections of Wisconsin and New England. Snowfall was again below normal in the Far West, but was unusually heavy from northern Texas northeastward through the Ohio Valley and Middle Atlantic States. Two major snowstorms accounted for most of the snow in the Northeast. During the first storm on the 3d and 4th, heavy amounts were measured from Virginia to New England, over 8 inches in Washington, D. C., 10 to 20 inches in much of Pennsylvania, and 1 to over 2 feet in much of south and central portions of New England and New York State. Strong winds produced drifts up to 10 feet high. In parts of the Northeast a heavy snow cover was already on the ground, and after this storm depths ranged up to 55 inches in Litchfield County, Connecticut, and up to 40 inches over Worcester County, Massachusetts. The second storm on the 8th dumped heavy snow, ranging from 5 to 15 inches, over Maryland and northern Virginia, where several roofs collapsed under the weight of the snow which ranged up to 31 inches deep at Chewsville, Maryland, and 44 inches at Lantz, Maryland. In the midcontinent area, up to a foot of snow fell in the Texas Panhandle on the 4th, 10 to 15 inches in sections of northern Iowa on the 17th and 18th, and 10 to 20 inches west of Lubbock, Texas, on the 20th. Over an inch of glaze caused heavy damage in northern and western Iowa on the 17th and 18th. Heavy rainfall from the 18th through the 25th caused major flooding in Mississippi, Alabama, and Georgia. Monthly totals were the greatest on record for February at Atlanta, Georgia (12.77 inches), Birmingham, Alabama (17.67 inches), and Mobile, Alabama (13.38 inches). The first outbreak of severe thunderstorms and tornadoes occurred in the lower Great Plains on the 17th and 18th.

MARCH - The weather of March was generally mild and wet, although southern Texas and the northern Great Plains were extremely dry. Much flooding occurred in central and southern sections of the Nation. A cold spell occurred east of the Rockies on the 9th and 10th when freezing occurred in the Winter Garden area of southern Texas and light to moderate frost in the Florida Everglades, causing some light to moderate crop damage. Another cold spell on the 17th and 18th was limited mainly to New England, with subzero minima rather general over that section. At the end of the month, soil moisture was deficient in southern Texas and in the northern Great Plains. Precipitation occurred on about half the days and was unusually heavy for the month in the central Great Plains and Mississippi Valley. In the upper Mississippi Valley, floods were responsible for millions of dollars damage. Several snowstorms occurred in the midcontinent area during the month. Heavy snow from the central Great Plains to the Great Lakes, from the 3d to the 8th, accumulated to more than a foot at numerous locations and the ground remained covered until about midmonth. From the 6th to the 8th, snowfall up to 20 inches in northern Iowa was drifted as much as 20 feet high in northeastern Iowa. Snowfall in the Far West was substantial in Utah, Colorado, and New Mexico, but the mountain snowpack still remained below normal except for near normal amounts in Washington and New Mexico. Numerous, severe local storms in central and southeastern sections of the country during March were highlighted by a tornado which killed 1 person, injured 115, and damaged 3,000 homes and other buildings. A very severe hailstorm with stones up to 4.5 inches in diameter, struck Shreveport, Louisiana, on the 27th, and damaged more than 10,000 buildings.

APRIL - April was abnormally cold, with heavy snowfall in many northern areas. Freezing about midmonth in the Far West damaged fruit buds in local areas. Precipitation was much below normal in the Florida Peninsula and the lower Great Plains, and droughty conditions continued in the Great Basin and Far Southwest. Near to above-normal precipitation elsewhere was beneficial in the northern Great Plains, but resulted in considerable flooding in the Mississippi Basin and Southeast where wet soil delayed spring planting. This month was the coldest April

since 1907 at numerous points in the middle Mississippi Valley and Eastern States. Snowfall was again abnormally light in the Far West, but was above average from the northern Great Plains to the Atlantic coast. On the 15th, 16th, and 17th heavy snow fell over north-central areas, and strong winds drifted the snow 10 feet high in northern portions of Illinois and Indiana, stranding thousands of travelers. Numerous storms of wind and hail and several tornadoes occurred in the lower midcontinent area and the Southeast the latter part of the month. One storm of hail and wind damaged about 30,000 buildings, with damage of several million dollars, in Joliet, Illinois, on the 23d.

MAY - Unseasonably cold weather that began in April continued through May east of the Rocky Mountains. It was the coldest May on record at points in the Ohio and middle Mississippi Valleys. Temperatures during the closing days of the month fell to the lowest levels on record for so late in the season at numerous stations from the Mississippi Valley to the Atlantic coast, and snowfalls in the north-central Interior were among the latest on record at numerous locations. Extremely heavy precipitation from the east-central Great Plains eastward through the Ohio Valley was responsible for flooding along many streams during most of the month. Spring, from an agricultural standpoint, was about 2 weeks later than usual in much of the eastern half of the country as a result of continued cold, wet weather. Drought continued in the Far Southwest. The worst tornado of the month killed 16 persons, injured more than 50, and destroyed many buildings as it moved over Howe and Reichert, Oklahoma, on the 5th.

JUNE - Unseasonably cool weather continued in the southeastern quarter of the Nation for the third consecutive month. Some stations in the Southeast had their coolest June of record, and others the coolest May-June period on record. In contrast, the month was among the hottest Junes on record in the Far West. In the Far Southwest, several stations reported daily minima in the middle and high 80's, the hottest nights in that region in many years. Precipitation was extremely heavy along the Gulf and South Atlantic coasts, with some flooding in Texas, Louisiana, and Mississippi. Hot, dry weather created a drought in the northern Great Plains by the end of the month, and continued the severe drought in Utah and Nevada, considered to be the worst drought since 1934 and, perhaps, on record in the latter State. A high fire hazard existed in most of the Far West.

JULY - Unseasonably cool weather continued in much of the eastern half of the United States for the fourth consecutive month. This was the coolest July in 50 or 60 years at Atlanta, Georgia, Baton Rouge, Louisiana, and Abilene, Texas, and the coolest May-June-July period on record at St. Louis, Missouri. However, the weather was extremely hot and humid in the Atlantic Coastal States the last 10 days of the month. Hot, humid weather continued for the second consecutive month west of the Continental Divide. At Sacramento, California, an intense heat wave from June 13 to July 28, during which the temperature rose to 90° or above on 38 days and to 105° or above on 11 days, was one of the longest and hottest periods there in 85 years of record. Precipitation was unusually heavy in a broad belt extending from Texas to the Great Lakes. Monthly totals ranged up to more than a foot at some stations. Although some flooding occurred in Texas and Louisiana, the rainfall in this belt was generally well distributed through the month and furnished plenty of moisture for good crop growth. Rainfall was also plentiful in the remainder of the East, except along the Atlantic coast where several areas needed more moisture. Above-normal rainfall in the upper Mississippi Valley generally relieved the dry soil conditions that developed there in June. In the northern Great Plains, the overall drought situation showed some improvement owing to showery weather which began about the 10th and occurred at intervals during the remainder of the month. Rains were too late, however, for the grain crop in western North Dakota and eastern Montana. Dry weather continued in most of the Far West; a high fire hazard

existed; and at Reno, Nevada, reservoirs were at lowest levels since 1934, and partial rationing of both domestic and irrigation water supplies was in effect. Numerous severe, local storms and flash floods occurred in the midcontinent area. A tornado injured 22 persons in Sidney, Ohio, and vicinity on the 28th. A flash flood in Charleston, West Virginia, on the 19th, was blamed for 22 deaths and millions of dollars damage.

AUGUST - The month was notable for record-breaking heat from the Dakotas to the Pacific coast. Many stations with long-term records in this area had their hottest August on record, among which were Rapid City, South Dakota; Sheridan, Wyoming; Portland, Oregon; Havre, Montana; and Seattle, Washington. At Orofino, Idaho, 116° recorded on the 4th was the highest temperature ever recorded in that State during August, and 118° at Ice Harbor Dam, Washington, set a new August record for that State. The month was unusually cool in south-central areas where temperatures were persistently below normal. Shreveport, Louisiana, had its coolest August on record. Precipitation was spotty across the Nation, with monthly totals ranging from only a few hundredths or none at all at some western stations; up to 10 inches or more in the South and East. In the northern Great Plains, where droughty conditions prevailed most of the summer, August was extremely dry and the drought continued. Large areas in the Southwest received beneficial amounts. Rainfall was generally adequate for agriculture east of the Great Plains.

SEPTEMBER - The weather of September was highlighted by Hurricane Carla, which was blamed for 46 deaths, over 500 injuries, and property losses estimated in the neighborhood of \$200 million. Carla's path across east Texas was accompanied by extremely heavy rains of 10 to 16 inches along the first 50 miles of her path inland, and, in a wide belt from north Texas to Michigan, amounts generally ranged from 3 to 8 inches. These heavy rains were mainly responsible for the greatest monthly totals of precipitation on record at Chicago and Peoria, Illinois, 14.17 and 13.09 inches, respectively. Heavy rains in the northern Great Plains helped replenish soil moisture depleted by summer drought. The month was dry in the Southeast where soil moisture in many localities was very short. Temperatures for the month averaged below normal west of the Mississippi River and above in the East. The month was unusually cool in the Rocky Mountain region following an extremely hot summer there. Temperatures averaged below normal in the lower Great Plains for the sixth consecutive month. September was the fourth consecutive relatively warm month in the Northeast. Several northern localities had unusually early snowfall. A fall of 4.2 inches at Denver, Colorado, on the 3d, was the earliest on record there; Williston, North Dakota, had 1.5 inches on the 2d, the most on record there for so early in the season; and Omaha, Nebraska, had its first snowfall in September since 1891.

OCTOBER - Pleasant weather prevailed during October. Temperatures for the month averaged within 4° of normal in all sections of the country, and only a few relatively small areas had unusually heavy precipitation. The season's first freezes in most areas generally occurred on or near their normal dates and caused no significant crop damage. Dry, sunny weather favored maturity and harvesting of crops. Few severe storms occurred, and flooding was limited to a few local areas. Three pronounced weather abnormalities occurred during the month, however. A record-breaking heat wave in southern California on the 14th and 15th sent the mercury to the highest points on record for October at San Diego (107°) and Los Angeles (106°) on the 14th, and to the highest mark reported anywhere in the United States during the month at Long Beach (111°) on the 15th. Extremely dry weather in the Southeast, where some stations reported no precipitation at all, was unfavorable for pastures and fall-sown grains, but favored harvesting operations. Snowfall was unusually heavy in the northern Rocky Mountain region, with falls up to 2 feet in Wyoming during the first week.

General snowfall in the Rockies late in the month ranged up to more than 3 feet in Colorado and up to a foot in the northern and western mountains of New Mexico. On the 20th and 21st, snowfall in the lower Appalachians, while generally light, ranged up to 23 inches in Nicholas County, West Virginia, where the snow was wet and heavy and caused considerable damage.

NOVEMBER - The weather was cold and snowy in much of the Far West and southwestern Great Plains, and unseasonably mild in the northern Great Plains and east of the Mississippi River. Precipitation was unusually heavy in south-central portions of the Nation and caused some flooding there. The month was extremely dry in the Dakotas and some adjacent areas of surrounding states. Considerable snow fell in the far western mountains. Accumulations in the Cascade Mountains increased about 4 feet during the month. Snowfall, in general, was unseasonably light east of the Rockies, although some locally heavy falls were reported in the Northeast. In southwestern California, forest fires on the 6th were responsible for millions of dollars damage.

DECEMBER - December was a rather cold month in nearly all sections of the country. The first half of the month was unusually cold in the western two-thirds of the Nation, and the second half rather mild. In the eastern third, the last week was unusually cold. Freezing and frost occurred in portions of the Florida Everglades on the 26th and 30th, and tender vegetable crops were damaged. The last part of the second week was extremely cold in the midcontinent area, and -26° at Kirwin, Kansas, equaled the lowest temperature ever recorded in that State during December. Precipitation, much of which was in the form of snow in northern areas, was very light in much of the Great Plains area and the Florida Peninsula and south Atlantic coastal areas, and unusually heavy in a large area extending from the lower Appalachian region to the central Gulf coastal region and including the lower Mississippi Valley. Most of the heavy rainfall in this region fell during the first half of the month, and considerable flooding occurred during the last 3 weeks. Snowfall in the Far West was heavier than in December 1960. Heavy snow fell in an area extending from the central Great Plains to New England on the 22d through the 25th. This storm was a severe blizzard in parts of Iowa where more than a foot of drifting snow stranded thousands of workers and travelers, and amounts in the Northeast ranged up to about 2 feet in central New England. Several inches of snow fell in the Atlantic Coast States from Georgia to southern New England at the end of the month. (Summary supplied by U. S. Weather Bureau).

SUMMARY OF INSECT CONDITIONS - 1961

GRASSHOPPERS

Highlights: There was a significant increase in grasshopper populations on rangeland in the Midwestern and Western States as shown by the 1961 adult survey. This was particularly true in parts of Arizona, Idaho, Montana, New Mexico, Nevada, North Dakota, Texas, Utah, Washington and Wyoming. Surveys indicate that 1,018,970 acres of Forest Service lands in 11 states may be economically infested in 1962, and 10,000 acres of Forest Service lands in Utah may require Mormon cricket baiting in 1962. On U. S. Department of Interior lands, 1,030,640 acres are economically infested with grasshoppers, while Mormon crickets infest 28,000 acres on such lands. The outlook for 1962 appears to be somewhat more serious than that for 1961. Rather substantial acreages in several Western States had high populations of grasshoppers laying eggs at the end of the summer. Late fall examinations revealed some increase in parasites and predators, but these natural controls probably will not substantially reduce the threat. A total of 487,085 acres were cooperatively treated in Montana, North Dakota, Oregon and Wyoming during the summer of 1961.

The chart below depicts the acres supporting moderate or heavy populations of grasshoppers on rangeland. This is based upon the results of the cooperative adult surveys made during the late summer and fall of 1961. The figures for each state include private, state and Federal lands totaling 13,351,890 acres.

State	Land Ownership - Acres		Total Acres
	Private and State	Public Domain	
Arizona	35,250	22,750	58,000
California	542,890	36,000	578,890
Colorado	574,100	37,700	611,800
Idaho	75,250	215,610	290,860
Montana	6,737,000	1,221,000	7,958,000
Nevada	15,830	52,000	67,830
New Mexico	776,500	13,500	790,000
North Dakota	219,160	236,320	455,480
Oklahoma	185,000	---	185,000
Oregon	100,800	13,500	114,300
South Dakota	191,260	103,320	294,580
Texas	577,300	---	577,300
Utah	216,800	100,750	317,550
Washington	637,000	2,000	639,000
Wyoming	393,500	19,700	413,200

Grasshopper infestations on croplands were generally higher than those of 1960. Considerable control was practiced in areas of the North Central States.

The predominant species of grasshoppers occurring in rangeland areas of CALIFORNIA were DEVASTATING GRASSHOPPER (Melanoplus devastator), CLEAR-WINGED GRASSHOPPER (Camnula pellucida) and Oedaleonatus enigma. Results of the adult survey in the late summer of 1961 indicate some 578,890 acres had moderate to heavy populations. Most of this acreage is in the northern part of the State. This figure is approximately one-half the area reported in 1960. In 1960, the fungus disease Entomophthora grylli was very prevalent and, along with a drought condition, is considered responsible for the lack of high populations in 1961. The fungus disease occurred early in 1961, but was not as prevalent as in the previous year. Drought conditions prevailed during 1961 in California and early indications of large populations did not develop. A few local areas required control measures, but no large scale treatments were applied and cropland invasions by grasshoppers were few and very local. An unusual occurrence of heavy populations of devastating grasshopper adults was found in several hundred acres of rangeland in the area east of Red Bluff, Tehama County, in January. This population decreased rapidly and, by April, only an occasional grasshopper could be found.

Generally, light grasshopper populations occurred early and developed into heavy populations on alfalfa by June in the North Desert, San Bernardino County, California. Very heavy populations occurred in the Coahuila Indian Reservation in April, which required treatment of several thousand acres later in the season in Riverside County. Some heavy populations developed and required treatment in mountain areas in San Diego County. Spotted, heavy populations developed early on alfalfa in Imperial County. In June, areas that were infested with grasshoppers developed medium to heavy populations and considerable local control measures were used. Tomatoes and plums were damaged by medium populations in Esparto and Dunigan, Yolo County. Olives in Corning and irrigated pastures in El Camino were invaded in Tehama County. Grain, alfalfa and pastures had medium to heavy grasshopper populations which required baiting in the Scott and Shasta Valleys, Siskiyou County. Generally, heavy populations invaded home gardens and pastures, requiring bait and spray control in Shasta County. Light populations

damaged Christmastree plantings in Santa Cruz County; medium populations damaged safflower plantings in Panoche, San Benito County; medium infestations damaged pastures, range and home gardens in Lincoln, Placer County. Varying grasshopper populations, ranging from light to heavy, occurred in orchards, vineyards and rangeland in Anderson Valley, Covelo and Hopland, Mendocino County. High populations developed on rangeland in Burns-Morgan Valley, Lower Lake and Middletown in Lake County.

Generally, light grasshopper populations occurred in Calaveras County, California, with a few heavy, local populations. Light populations developed in home gardens in Le Grand, Merced County. Generally, light populations were present on rangelands in Amador County and heavy populations developed in clover plantings in San Joaquin County. Medium to heavy local populations developed on rangeland in July in Humboldt County. Populations in other areas began tapering off during July. In general, grasshoppers were a local problem in California, and were controlled by baiting or by chemical treatments.

Grasshopper populations increased in Douglas, Elko, Eureka and Humboldt Counties, NEVADA, during 1961. In Douglas County, increases occurred in alfalfa and wild hay fields, with clear-winged grasshopper, MIGRATORY GRASSHOPPER (Melanoplus bilituratus), RED-LEGGED GRASSHOPPER (M. femurrubrum) and PACKARD GRASSHOPPER (M. packardii) the dominant species. In the latter 3 counties, increases occurred primarily in crested wheatgrass seedings, burned rangeland and wild hay fields, with Aulocara ellioti, migratory grasshopper, clear-winged grasshopper and Oedaleonotus enigma as the most prevalent species. Over 3,700 acres of crested wheatgrass and adjacent rangeland were treated in the Orovida and Paradise Valley areas of Humboldt County in 1961. The economic populations found during the 1961 fall adult grasshopper survey were primarily in the above-mentioned counties.

Grasshoppers were present in large numbers on rangeland in eastern MONTANA, mainly Ageneotettix deorum. Migratory grasshopper was found in east central and northeastern Montana grain fields and on rangeland. Statewide populations of grasshoppers were generally considerably higher than those recorded in 1960 in IDAHO; and, as in the past, migratory grasshopper was the more commonly encountered species. Grasshopper outbreaks in the eastern rangelands of WASHINGTON were the worst since 1955. Scattered infestations of first instars were found in the eastern area of Washington by early June, of which 90 percent were migratory grasshopper and 10 percent TWO-STRIPED GRASSHOPPER (Melanoplus bivittatus) and Packard grasshopper. Heavy infestations developed in most of the eastern rangeland and some intermingled croplands by late July in the State; several hundred thousand acres. Considerable treatments were applied by individual ranchers in Washington. Migratory grasshopper was not an economic problem during 1961 in ALASKA.

Grasshopper damage increased in the dryfarm area of UTAH in 1961, often due to a buildup of these insects in Conservation Reserve Lands. Damage for the State in crop and range was estimated at \$915,000, while control practices resulted in a saving estimated to be \$620,000. Many farmers in larger outbreak areas in Utah were discouraged in controlling grasshoppers because of the anticipated low yields. Conservation Reserve farmers had no incentive to control grasshoppers. The dominant species in Utah in 1961 were migratory grasshopper, two-striped grasshopper, Packard grasshopper, red-legged grasshopper, clear-winged grasshopper, Melanoplus bruneri, M. borealis and Aulocara ellioti. Several small incipient infestations of range grasshoppers were controlled with ground units in Iron and Kane Counties.

Grasshoppers were a problem on rangeland grasses and on alfalfa in some areas of ARIZONA during 1961, but generally they were of only minor importance. In NEW MEXICO, no cooperative control programs were conducted on rangeland during the year, but several heavy infestations developed, especially in eastern sections of the State. Populations on rangeland in COLORADO were economic, 4 to 40 per square yard, in areas of Baca, Las Animas, Huerfano, Pueblo, Fremont, Archuleta,

San Miguel, Kiowa, Cheyenne and Yuma Counties. No cooperative control program was initiated in any of the Colorado areas concerned. Some growers used bait and sprays where grasshoppers were adjacent to croplands. The species present included Cordillacris occipitalis, Aulocara elliotti, migratory grasshopper, two-striped grasshopper, Melanoplus confusus, M. occidentalis, Aeoloplides turnbulli and Ageneotettix deorum. Loss of livestock feed due to grasshoppers in Colorado was light because of the excellent moisture conditions which prevailed. Weight gains by cow-calf units were very good during the grazing season. Areas that are expected to have high grasshopper populations in 1962 include portions of Huerfano, Pueblo, Baca, Las Animas, Kiowa, Crowley and Yuma Counties. The infestations in these areas are present on land adjacent to cropland. Grasshoppers damaged 4 drill widths of fall-planted wheat in Kiowa and Crowley Counties; bait and spray were applied to prevent further damage by grasshoppers migrating from Conservation Reserve Lands. Grasshoppers also caused a light amount of damage to barley in a few fields that were adjacent to Conservation Reserve Land in Colorado.

Grasshopper infestations in WYOMING were not as serious as they were in 1960 except for a fairly large infestation in north central Crook County, approximately 8,000 acres in Sheridan County and scattered infestations in Campbell County. There has been a definite increase in both population numbers and area infested by grasshoppers in NEBRASKA. Many small areas of economic infestation were found present over most of the State, especially in the east, southeast and south sections. However, the northeast area contains a general infestation. Migrations in Nebraska were on a local basis. Chief centers of populations were in Conservation Reserve Land, idle land, legumes and small pastures. The dominant species varied with the locality and fields. There was a definite increase in red-legged grasshopper in the eastern one-third of Nebraska, and there are indications of an increase in two-striped grasshopper and of DIFFERENTIAL GRASSHOPPER (Melanoplus differentialis) in croplands over the State. Migratory grasshopper is quite general both in rangeland and cropland and has increased slightly. In most instances, economic grasshopper populations were a combination of two or more of the above-named species. The rangeland infestations have undergone considerable change from a species standpoint in the last 3 years. Areas of Nebraska formerly carrying economic populations of 90 percent Ageneotettix deorum have changed to a multiple species complex, with A. deorum making up less than half of the total population.

Grasshoppers remained at a very low level of infestation in KANSAS, and only a few farmers applied controls. A few areas in the southwest reported grasshoppers to be a problem in fall-seeded wheat. The predominant crop species were migratory grasshopper, red-legged grasshopper and differential grasshopper. In OKLAHOMA, early instar grasshopper nymphs began to appear in the southwest by late April, with damaging infestations in areas of the southwest, west central and south central sections by mid to late May. Light populations were present on range and cropland in the northwest and panhandle areas by early June. Populations remained generally light throughout the panhandle area, with some localized moderate to threatening populations. By mid-July, counts declined in the southwest, but locally heavy populations were noted in the northwest. Economic populations doing marginal damage to crops and rangeland were reported until late August when the populations began to decline in the northwest and panhandle areas. Light to noneconomic populations were generally existent in the eastern half of Oklahoma. Some localized marginal damage was noted to wheat fields in the northwest in the early fall when native forage became less palatable. Generally, grasshopper damage was light in Oklahoma even though large populations existed. Abundant natural forage was present, which made damage to rangeland less noticeable. The predominant species in the State were Aulocara elliotti, Ageneotettix deorum, Amphitornus coloradus, Hesperotettix viridis, H. speciosus, two-striped grasshopper, migratory grasshopper, Packard grasshopper, differential grasshopper, Phliobostroma quadrimaculatum and Syrbula admirabilis.

Differential grasshopper was the primary cause of grasshopper damage to sorghum in various sections of TEXAS. Border infestations in cotton and soybeans in the delta of ARKANSAS were of minor importance and few infestations became economic. Only a few very small areas of heavy infestation have existed in Arkansas for many years. In MISSOURI, grasshoppers were observed on corn and grain sorghum.

In SOUTH DAKOTA, light hatches of two-striped grasshopper were noted in the central area on May 8. Hatching continued through May, June and into July, indicating uneven development of eggs during the previous fall. By mid-June, heavy infestations of first to third instars of two-striped grasshoppers were appearing in Dewey and Perkins Counties. Roadside counts were tallying 25 "hoppers" per square yard in these areas. Some migratory grasshopper, differential grasshopper and red-legged grasshopper were also present. The hatch remained light over most of the eastern areas. By June 23, high populations existed in portions of the rangeland in the northwest area and in some cropland in the central area. Counts varied widely from 0 to 64 grasshoppers per square yard. Hatching was still occurring in the northeast area during the second week of July, but populations remained in the noneconomic to light category. Populations in the east central and southeast areas also remained noneconomic to light. Threatening to severe conditions existed in portions of northwest and central South Dakota throughout July and August. Some migration of migratory grasshopper occurred. Treatments were done on an individual basis in most areas. The dominant species of grasshoppers in South Dakota during 1961 appeared to be two-striped grasshopper. Other species present, but in varying degrees of abundance, were migratory grasshopper, red-legged grasshopper, differential grasshopper, Packard grasshopper, Trachyrhachis kiowa and many other species found in localized areas. As a whole, the cropland infestation was heavier and more extensive than in 1960 in South Dakota, with the north central, central and northwestern parts of the State having the most infestations.

On cropland in NORTH DAKOTA, threatening to severe infestations were widespread in most sections. Drought conditions reduced marginal food supplies and forced grasshoppers into field crops and forage. Severe crop damage occurred over a wide area early in the season. Controls were applied to an estimated 5 million acres to protect crops. Control measures in general gave good results, but some fields required additional treatment to prevent reinfestation. The major grasshopper egg hatch began in northwest North Dakota during the first week of June, and by July 10, 75 percent of the grasshoppers in the area had reached the adult stage. Similar conditions developed in the southwest, southeast, north central and northeastern areas of the State. Clear-winged grasshopper reached outbreak proportions in the northwestern counties along the Canadian Border. Severe damage occurred to small grains, forage crops and small pastures in many communities. This is believed to be the first recorded economic infestation of this species in the State in recent times. Economic infestations of two-striped grasshopper, migratory grasshopper and red-legged grasshopper were also widespread. Increased populations of differential grasshopper were noted in southeast North Dakota.

On rangeland in North Dakota, general, threatening to severe infestations occurred in Williams, McKenzie, Golden Valley, Slope, Dunn and Billings Counties (west section) and in Richland and Ransom Counties (southeast section). Cooperative Federal, State, County and Rancher aerial spray programs were conducted on 64,796 acres of range in McKenzie County and on 13,978 acres in the sandhills area of Richland and Ransom Counties. Excellent control of grasshoppers was achieved in these areas. Development of rangeland species followed closely that of cropland species in North Dakota. Drought conditions, coupled with high populations of grasshoppers, appeared to accentuate damage suffered by range grasses and forbes. The dominant rangeland species included Ageneotettix deorum, Aulocara ellioti and migratory grasshopper. Scattered, heavy infestations of clear-winged grasshopper were observed in northwestern Dunn and northeastern McKenzie Counties. Heavy aerial migration of migratory grasshopper was observed

at Cartwright, McKenzie County. Melanoplus kennicotte kennicotte and Trimero-
tropis agrestis were recorded in North Dakota for the first time during the
1961 season.

Early in the spring, grasshopper eggs showed advanced development in MINNESOTA; apparently some egg development had occurred the previous fall. Because of relatively cool weather during May, the anticipated early egg hatch did not take place, however. The hatch was not any earlier than in 1960. The first hatch in Minnesota, primarily two-striped grasshopper, occurred in the north-west district in late May. By the end of June, the hatch of nearly all species but red-legged grasshopper was complete. The peak hatch of red-legged grasshopper did not occur until the second week of July. The principal grasshopper-infested habitat was alfalfa or alfalfa-grass mixture, although high populations occurred in other legumes, ditch banks and field margins. Conservation Reserve Lands again had heavy infestations in some Minnesota areas. Some emergency treatment of Conservation Reserve Land and field margins in the northwest district was needed in early June to prevent movement of grasshoppers into cropland. Severe localized damage was reported from several areas of the State in July. Red-legged grasshopper continued to be the predominant species in all districts of the State. Populations of two-striped grasshopper, migratory grasshopper, clear-winged grasshopper, Packard grasshopper and differential grasshopper increased in many areas of Minnesota, especially in the northwest and west central districts, and each was found to be the predominant species in some fields. The adult survey during the fall showed moderate to heavy populations most numerous in the northwest and west central districts, with small localized areas scattered throughout the State. Economic grasshopper infestations were dispersed and localized, with no large contiguous blocks found infested. The 1962 outlook is for higher grasshopper infestations in Minnesota, especially in the northwest and west central districts. Infestations will probably be scattered and localized. The potential for high grasshopper populations in 1962 is present, however, and weather conditions at and after hatching time will determine the extent and severity. The grasshopper egg hatch can occur from May 15 through July in Minnesota, with early species starting around June 1 and later species from mid-June through July.

Grasshoppers, principally red-legged grasshopper, attained a high population in WISCONSIN and caused considerable concern in many areas of that State. Despite this higher incidence, treatments were less than 1960 in many counties. Eggs of red-legged grasshopper began hatching in Dane County alfalfa fields during the first week of June and continued until about the first of August. Population averaged slightly higher in 1961, with 11 per yard at each stop, compared with 10 in 1960. Grasshopper numbers decreased in the eastern portion of the State and increased considerably in the west central and northwestern areas of Wisconsin.

Melanoplus spp., mainly red-legged grasshopper (M. femurrubrum), were abundant in most parts of ILLINOIS. A few nymphs were observed in early June, but the main hatch did not occur until June 10 to 20. By July 15, nymphs numbered 30 to 700 per 100 sweeps in grassy roadsides, ditch banks, clover and alfalfa fields, and migrations into soybean fields were observed in a few places. In August, populations in some clover fields ran as high as 60 to 80 per square yard. Some clover fields were completely stripped of leaves in Illinois, and migrations into corn and soybeans were heavy. Melanoplus spp. were more abundant and populations continued to increase over previous years in INDIANA. Two-striped grasshopper was not observed in the northern half of Indiana. Differential grasshopper caused extensive defoliation in 2 corn fields in Butler County, OHIO. Severe defoliation and damage to corn ears covered an area of 5 acres in one field. In September, limited acreages of clover, soybeans, corn and potatoes in Mercer and Clinton Counties, Ohio, were reported receiving economic damage to such an extent that control measures were justified. In NEW YORK, grasshopper populations did not seem to be as high as in previous years, and grasshopper populations remained exceptionally low in VERMONT.

UNITED STATES DEPARTMENT OF AGRICULTURE

WASHINGTON 25, D. C.

Official Business

POSTAGE AND FEES PAID

